Sex Differences In Parkinson Disease Pain Relief Following DBS

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Disclosures

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Introduction

- Deep brain stimulation (DBS) of the subthalamic nucleus (STN) effects non-motor symptoms of Parkinson’s Disease (PD) differently from patient to patient.

- Whether demographic factors, such as sex, affect non-motor changes induced by DBS has not been explored.
Introduction

- Previous studies have investigated the different non-motor symptoms presented in females versus males in PD.
- Effects on DBS have not been explored.

<table>
<thead>
<tr>
<th>Females</th>
<th>Males</th>
<th>Overlapping Symptom</th>
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<tbody>
<tr>
<td>Weight Change</td>
<td>Decreased libido</td>
<td>Pain</td>
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<tr>
<td>Anosmia</td>
<td>Sexual Dysfunction</td>
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<tr>
<td>Diaphoresis</td>
<td>Drooling</td>
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<td>Ageusia</td>
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<td>Mood Changes</td>
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- Pain symptoms include:
  - Decreased libido
  - Sexual Dysfunction
  - Drooling
Methods

- **Participants**
  - Patients who underwent bilateral STN DBS placement for standard of care treatment of PD at Albany Medical Center

- **Demographic Data**
  - Sex
  - Age at time of surgery
  - Duration of Illness
  - Severity of motor symptoms: Unified Parkinson’s Disease Rating Scale (UPDRS) III On medication and Off medication testing
  - Neuropsychological profile
  - Stimulation settings
  - Levodopa Equivalent Doses (LEDD)
Methods

Outcome Measures

- Lower Back Disability Index (LBDI)
- King’s Parkinson’s Disease Pain Scale (KPDPS): 14 questions describing the different types of pain and their severity and frequency.
  - Explores 7 domains of pain: 1) Musculoskeletal, 2) Chronic pain, 3) Fluctuation-related pain, 4) Nocturnal pain, 5) Oro-facial pain, 6) Discolouration; Edema/swelling, 7) Radicular pain
- Numerical Rating Scale (NRS)
### Results

<table>
<thead>
<tr>
<th>Sample size</th>
<th>n = 20</th>
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<td>Females, Males</td>
<td>6, 14</td>
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</table>

| Mean post-operative follow-up (range) | 11.8 (6-42) months |
| Mean age at time of surgery (±SEM) | |
| Female | 69.5 ± 2.6 years |
| Male | 60.9 ± 1.9 years |

| Mean duration of illness (±SEM) | |
| Female | 9.3 ± 1.9 years |
| Male | 12.9 ± 1.3 years |

| Mean preoperative UPDRS-III (ON, OFF) | |
| Female | 25.3 ± 5.5, 29.3 ± 6.6 |
| Male | 17.6 ± 2.4, 40.4 ± 2.3 |

| Mean preoperative LEDD (±SEM) | |
| Female | 1068.8 ± 421.9 MeQ |
| Male | 1663.2 ± 253.6 MeQ |

| Mean postoperative LEDD (±SEM) | |
| Female | 1062.1 ± 500.3 MeQ |
| Male | 911.7 ± 125.5 MeQ |
Results: Outcome measures

- **LBDI**
  - Male scores decreased by 52% between baseline and the post-operative time-point (p=0.03*)
  - Female scores decreased by 30% between baseline and the post-operative time-point (p>0.05)

- **KPDPS**
  - Male KPDPS total scores decreased from 15.7±3.1 at baseline to 6.0±1.9 post-operatively (p=0.0002***)

- **NRS**
  - No change in either group

- No effect of age at time of surgery, duration of disease, UPDRS, and LEDD.
Results: Figures

Figure 1: Male LBDI scores at baseline and post-operative time-point (p=0.03*)

Figure 2: Male KPDRS total scores at baseline and post-operative time-point (p=0.0002***)

Discussion

- Males showed greater and more significant improvement in outcome measures compared to females, specifically in LBDI and KPDPS measures.
- In our cohort, females were older than males.
  - A study found that females have a later onset of PD [Zagni et al.]
  - The differences we found may be due to sex differences in pain tolerance at different stages of life.
References